WHAT IS CLAIMED IS:

1. A GPS receiver, comprising

an antenna to collect a GPS signal that is a composite signal comprising a contribution from each GPS satellite in view of the receiver;

a signal conditioning processor to amplify, filter and downconvert the GPS signal to baseband;

an A/D converter to digitize the GPS signal at a pre-determined sample rate;

a memory to store a portion of the GPS signal;

an FFT process to convert the portion of the GPS signal stored in the memory to the frequency domain;

a multiplier for multiplying the frequency representation of the stored GPS signal with a frequency representation of a Gold code associated with one of the GPS satellites in view of the GPS receiver and for storing the result in the memory as a product;

an inverse FFT process for converting the product to the time domain as a convolution; and

a peak detector to find a location of a peak in the convolution, the location of the peak being an estimate of the Gold code phase.

2. The GPS receiver recited in claim 1, wherein the peak detector comprises curve fitting means to refine the estimate of the peak location.

3. The GPS receiver recited in claim 1, wherein the frequency representation of the Gold code is pre-computed and stored in memory.

4. The GPS receiver recited in claim 1, further comprising means for adjusting carrier frequency to improve the Gold code phase estimate.

The GPS receiver recited in claim 5, wherein the means for adjusting carrier frequency comprise means for performing a half-bin analysis.

6. A GPS receiver to receiver and detect a composite GPS signal comprising GPS signals from all GPS satellites in view of the GPS receiver, comprising:

an antenna to receive the composite GPS signal;

a memory to store a portion of the received composite GPS signal;

means for segmenting the stored GPS signal into plurality of segments; each segment one millisecond in duration;

an FFT process to perform an FFT on each segment;

a plurality of multipliers to multiply each FFT segment by a frequency representation of a GPS Gold code to generate a plurality of product vectors;

an inverse FFT process to convert each product vector to the time domain;

a magnitude calculator to calculate a point-by-point magnitude vector of each of the magnitude vectors;

an adder to calculate a point-by-point sum of each of the magnitude vectors;

a peak detector to determine a peak location as an estimate of the Gold code phase.

7. The GPS receiver recited in claim 6, wherein a carrier frequency of each segment is shifted prior to multiplication by the frequency representation of the Gold code.

8. The GPS receiver recited in claim 7, wherein the frequency representation of the Gold code is pre-computed and stored in the memory.

9. A method for detecting Gold code phase and carrier frequency in a GPS signal comprising the steps of:

collecting the GPS signal;

storing a one millisecond segment of the GPS signal in a memory;

converting the stored GPS signal to the frequency domain;

multiplying the frequency domain representation of the GPS signal by a frequency representation of a Gold code corresponding to a GPS satellite in view of the GPS receiver to obtain a product;

converting the product to the time domain to obtain a correlation signal;

detecting a peak correlation signal as the Gold code phase.

10. The method recited in claim 9, further comprising the step of adjusting a carrier frequency of the one millisecond sample to make the peak more distinct.

11. The method recited in claim 9, further comprising the steps of:

pre-computing the frequency representation of the Gold code; and

storing the pre-computed frequency representation of the Gold code in the memory.

12. The method recited in claim 9, further comprising the step of using a curve fitting routing to refine the location of the peak.

13. The method recited in claim 9, further comprising the step of performing a half bin analysis to further refine the carrier frequency.

14. A method for detecting Gold code phase and carrier frequency in a GPS signal comprising the steps of:

collecting a multiple millisecond portion of a composite GPS signal in a GPS receiver;

storing the portion of the composite GPS signal in a memory in the GPS receiver;

partitioning the collected composite into one millisecond segments;

converting each one millisecond segment to the frequency domain;

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multiplying each of the converted millisecond segments by a frequency representation of a Gold code corresponding to a GPS satellite in view of the receiver to generate a product;

converting each product to the time domain to obtain a correlation signal between each millisecond segment and the Gold code; and

determining a peak location corresponding to a Gold code phase using the correlation signals.

15. The method recited in claim 14, wherein the peak determining step uses non-coherent detection.

16. The method recited in claim 15, further comprising the steps of:

calculating a point-by-point magnitude for each of the correlation signals; and

summing point-by-point each of the calculated magnitudes.

17. The method recited in claim 14, wherein the peak determining step uses coherent detection.

18. The method recited in claim 17, further comprising the steps of:

determining an estimate of the peak location;

determining a frequency of a sine wave fitting complex values at the point of the peak location;

adjusting each correlation in accordance with the determined frequency of the sine wave;

summing point-by-point the points of the correlations;

calculating the magnitude of the summed correlations; and

determining a peak from the calculated magnitude.

19. The method recited in claim 17, further comprising the step of choosing only a few points around the estimated peak location to process.

20. The method recited in claim 19, further comprising the step of using a look up table to determine an estimate of the Gold code phase.